MODELLING WEEKLY RAINFALL DURING NORTHEAST MONSOON AND SOUTHWEST MONSOON – A CASE STUDY USING RAINFALL IN ANURADHAPURA

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This study presents the time series models for weekly rainfall distribution in Anuradhapura, Sri Lanka. Rainfall data from 1970 to 2005 were collected from Anuradhapura whether station. First of all explanatory analysis was carried out to understand the basic features of the rainfall distributions. According to the median rainfall distribution during last 30 years, week 48,49,50,51 and 52 for northeast monsoon and week 18 for southwest monsoon were identified as significant weeks. The predictions were made for those significant weeks.

The smoothing techniques were applied to forecast the weekly rainfall of Anuradhapura. For long term series, single moving average of order 14 and 21 were identified as best order of smoothing to forecast the weeks corresponding to SWM and NEM respectively. For single exponential smoothing and double exponential smoothing the smoothing constant, α was identified for both monsoons based on the root mean square error value. Single exponential smoothing method with the smoothing constant .09 and .01 found to better for both NEM and SWM respectively. The weekly rainfalls of selected weeks were forecasted using those smoothing constants.

Then Box Jenkins models were tried on the data. The ARMA models were fitted for those significant weeks. Based on Akaike information criterion, Bayesian information criterion, adjusted r-squared value and diagnostic checking ,MA(3) was selected as the best model for week 48 and ARMA(1,1) as the best model for week 18, 49, 51 ,52 and AR(1) as the best model for week 50.